Ash Creek Associates
Environmental and Geotechnical Consultants

September 26, 2012

Mr. Dwight Leisle
Port of Portland
7200 NE Airport Way
Portland, Oregon 97218

Re: Riverbank Pipe Observations
Willamette Cove Upland Facility
Portland, Oregon
ECSI No. 271
1056-03

Dear Mr. Leisle:

This letter presents the findings of research and site reconnaissance conducted to assess the riverbank pipes observed at the Willamette Cove Upland Facility (the Facility; Figures 1 and 2) in the St. Johns area of Portland, Oregon. Work at the Facility is being conducted under Voluntary Agreement EC-NWR-00-26 between the Port of Portland (Port), Metro, and the Oregon Department of Environmental Quality (DEQ; the "Consent Order").

BACKGROUND

The DEQ completed a site visit during the former Wharf Road area sampling completed in August 2012. Potential riverbank pipes were observed in various locations. The Port indicated in an email to the DEQ (dated August 13, 2012) that these pipes would be evaluated in a letter per the following protocol.

1. Review available historical Facility records to assess whether the presence of any outfalls have been observed. This review will include maps and drawings of any drainage features that may have existed historically.
2. Document each pipe material type, diameter, condition, and location.
3. Compare the locations of pipes identified to be embedded in the riverbank to historical riverbank sampling locations. As necessary, propose the scope for sampling and laboratory analyses.

RESULTS OF HISTORICAL REVIEW

City of Portland (City) outfall OF-49 discharges on the northern portion of the Central Parcel beach. Five additional outfalls (designated WR-189 through WR-193) were historically identified at the Facility as part of activities completed for the Portland Harbor Superfund Site Remedial Investigation and Feasibility Study and the Consent Order. Historical research and site reconnaissance were completed and documented in the memorandum titled *Reported Outfalls, Willamette Cove Upland Facility* (Port and Metro, 2006; Attachment A). The results of the research and site reconnaissance concluded the following:

- Reported outfall WR-189 appeared to be a historical outfall and is no longer active. The available historical documents did not provide any information on the presence or use of these outfalls beyond the listings on the City database.

- Reported outfall WR-190 appeared to be a 6-inch concrete pipe embedded in the riverbank and filled with soil. It is unknown whether this was ever a historical outfall.
- Outfalls WR-191, WR-192, and WR-193 do not exist and should be removed from the City's outfall database and from any maps depicting outfalls (current or historical) along the Willamette River.

The locations of these outfalls are shown on Figure 2. Outfalls WR-191 through WR-193 were apparently removed from the City's outfall data base as they are not presented on figures in the Lower Willamette Group's DRAFT Remedial Investigation (RI) report.

During the 2005 site reconnaissance, the following two additional observations were also made:

- A concrete/masonry-lined metal sleeve was observed by Metro on May 6, 2005 (southwest of the reported WR-190 location) and by the Port on May 11, 2005.
- A 4-inch pipe at the top of the Central Parcel southern beach area riverbank was located and photographed. This pipe is reportedly a steam line from a former boiler located on the Facility.

The 2006 memorandum included a review of historical reference materials. Historical references to WR-189 and WR-190 were identified in the reports reviewed. No information on any other historical non-City outfalls was found in the referenced reports.

RESULTS OF AUGUST 2012 SITE RECONNAISSANCE

Ash Creek Associates, a Division of Apex Companies, LLC (Ash Creek), completed a site reconnaissance on behalf of the Port and Metro in August and September 2012. The following pipes that were observed are documented in the Photograph Log presented as Attachment B. The pipe locations are shown on Figure 2.

- An approximately 5-inch-diameter steel pipe was observed in an oversteepened riverbank on the northern portion of the Inner Cove Beach on the East Parcel (Photograph 1; Attachment B). The pipe was oriented nearly parallel to the riverbank and appeared to be mixed with other debris (e.g., bricks, clay tile, etc.) in the riverbank. Consequently, this pipe is considered debris and does not constitute a current or historical discharge pipe from the Facility. No additional observations of this pipe were completed due to the oversteepened condition of the riverbank.
- A section of concrete pipe with a 6-inch inner diameter was observed on the riverbank on the northern portion of the Inner Cove Beach on the East Parcel (Photographs 2 and 3). Rip-rap rock removed from the riverbank side of the pipe confirmed that this pipe section was not connected to the riverbank. Consequently, this pipe is considered debris and does not constitute a current or historical discharge pipe from the Facility.
- A 5-inch-diameter steel pipe was observed in the riverbank adjacent to historical riverbank sample location WC-SSP-1 on the Central Parcel Photograph 4 and Figure 2. This pipe is located in the vicinity of the outfall previously designated by the City as WR-192. A tape measure was inserted into the pipe to a length of 28 feet (approximately 25 feet into the riverbank) before it met a blockage. Consequently, this pipe is considered to be in place. There was no evidence that this pipe is still active.
- A 5-inch-diameter steel pipe was observed in the riverbank adjacent to historical riverbank sample location WC-SSQ-1 (Photograph 5). This pipe is located in the vicinity of the outfall previously designated by the City as WR-191. A tape measure was inserted into the pipe to a length of 8 feet (approximately 5 feet into the riverbank) before it met a blockage. Consequently, this pipe is considered to be in place. There was no evidence that this pipe is still active.

- A concrete/masonry-lined metal sleeve was observed in the vicinity of historical riverbank sample location WC-SSS (Photograph 6). This is the same pipe segment that was observed in 2005. This pipe is considered debris and does not constitute a current or historical discharge pipe from the Facility.
- A 4-inch pipe was observed on the southern portion of the Central Parcel beach (Photograph 7). This is the same pipe that was observed in 2005 and reported in the 2006 memorandum to be a steam line from a former boiler that used to be located on the Facility.
- An approximately 5-inch hole was observed in the riverbank on the northern portion of the Central Parcel beach (Photograph 8). A tape measure was inserted into the hole to a length of 1.5 feet before it met a blockage. No pipe was observed associated with this hole. The hole appears to be an animal burrow.

EVALUATION OF PIPE IN VICINITY OF WR-192

The 5-inch steel pipe observed in the riverbank in the vicinity of location WR-192 s considered to be in place but does not appear to be active.

Historical composite samples were collected from locations WC-SSP-1 and WC-SSP-3 (no sampleable soil was identified at location WC-SSP-2) at two depths (shallow – 0-6 inches and deep – 24-30 inches). Concentrations of metals and polycyclic aromatic hydrocarbons (PAHs) were detected in the shallow and deep samples at concentrations elevated relative to the Joint Source Control Strategy (JSCS) screening criteria (DEQ/EPA 2005). Follow-up analyses of the discrete samples from WC-SSP-1 and WC-SSP-3 indicated that higher relative concentrations of metals and PAHs were attributed to location WC-SSP-1. Location WC-SSP-1 is located approximately 10 feet from the observed riverbank pipe.

EVALUATION OF PIPE IN VICINITY OF WR-191

The 5-inch steel pipe observed in the riverbank in the vicinity of location WR-191 is considered to be in-place but does not appear to be active. A historical composite sample was collected from location WC-SSQ but at a higher elevation than the observed riverbank pipe.

RECOMMENDATIONS

The only new information on upland pipes associated with the uplands is the uncovering of the pipes in the vicinity of WR-191 and WR-192 (Photographs 4 and 5; Figure 2). Sufficient laboratory analytical data are already available to complete the evaluation of the historical pipe in the vicinity of WR-192. This evaluation will be completed as part of the Source Control Evaluation (SCE) for the Facility.

The Port proposes to collect a soil sample below the pipe in the vicinity of location WR-191. The sample will be submitted for the following analyses.

- Metals by EPA 6000/7000 Series Methods;
- PAHs by EPA Method 8270-SIM; and
- Polychlorinated biphenyls (PCBs) by EPA Method 8082.

The proposed analyses are consistent with historical location WC-SSQ, with the exception of tributyltin (TBT), which was not detected in any of the historical riverbank samples.

The Port will also confirm that the WR-191 and WR-192 are inactive during the upcoming wet season and document these findings in the SCE.

If you have any questions regarding these activities, please contact the undersigned at (503) 924-4704.

Sincerely,

Michael J. Pickering, R.G.
Senior Associate Hydrogeologist

REFERENCES

Ash Creek, 2011. 2010 Source Control Sampling Results, Willamette Cove Upland Facility Portland, Oregon, ECSI No. 2066. May 6, 2011.

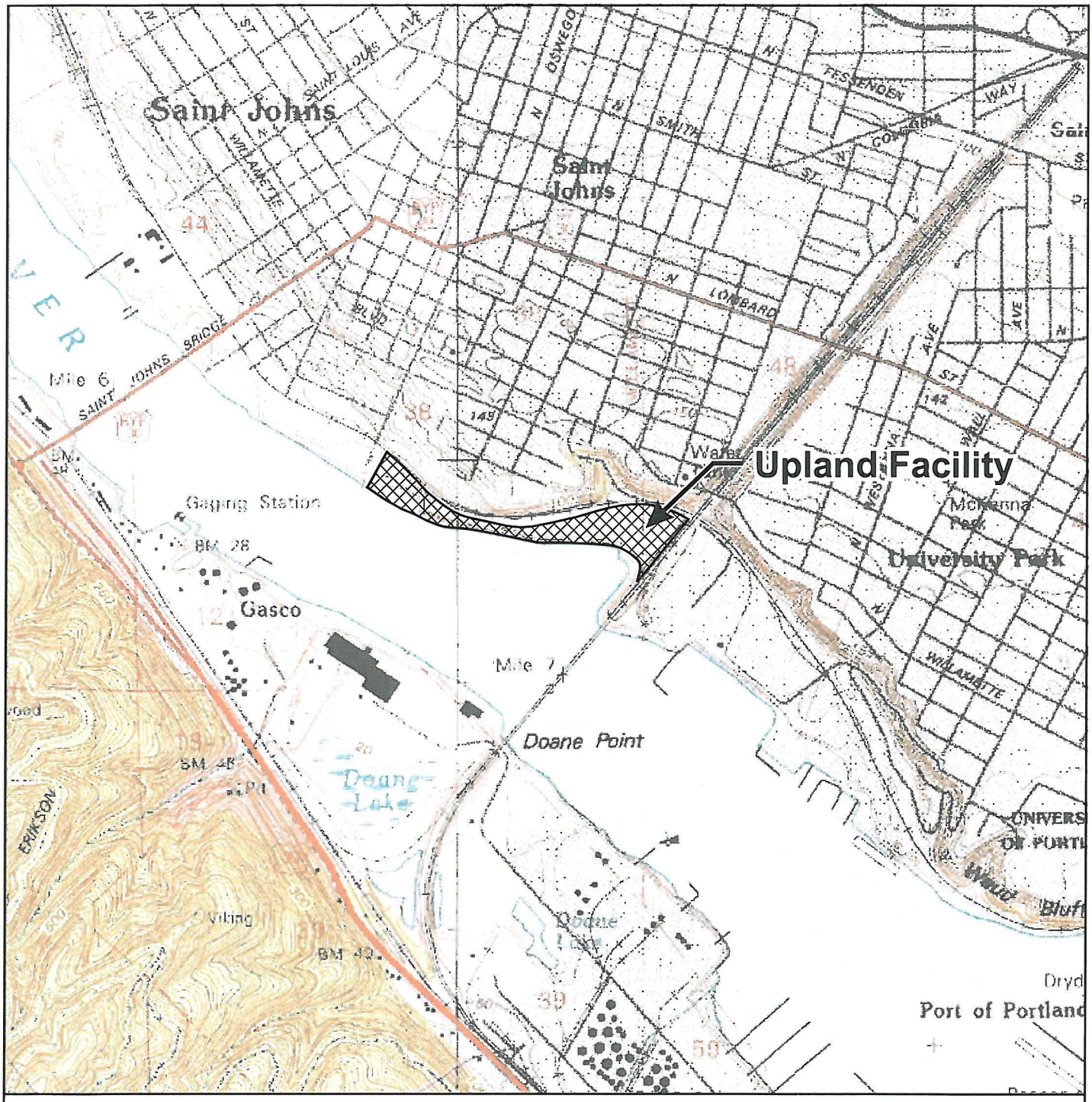
DEQ/EPA, 2005. Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.

Port and Metro, 2006. Memorandum titled *Reported Outfalls, Willamette Cove Upland Facility*. May 17, 2006.

ATTACHMENTS

Figure 1 – Facility Location Map
Figure 2 – Upland Facility Plan

Attachment A – 2006 Outfalls Memorandum
Attachment B – Photograph Log



Base map prepared from USGS 7.5-minute quadrangles as provided by TerraServer.

0 2,000 4,000

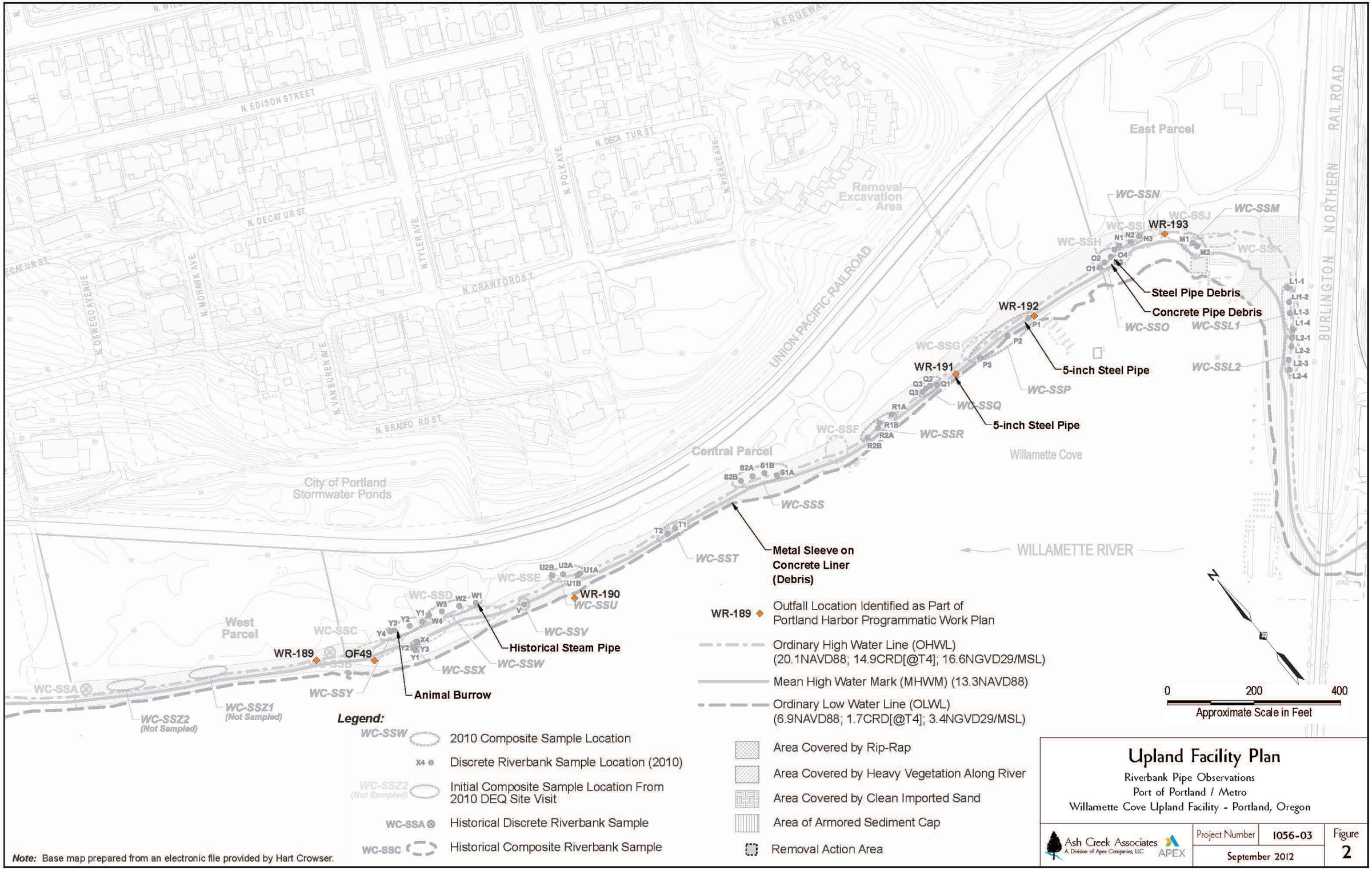
Approximate Scale in Feet

Facility Location Map

Riverbank Pipe Observations
Port of Portland / Metro
Willamette Cove Upland Facility - Portland, Oregon

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

Project Number	1056-03	Figure
September 2012		1



Note: Base map prepared from an electronic file provided by Hart Crowser.

Upland Facility Plan

Riverbank Pipe Observations
Port of Portland / Metro
Willamette Cove Upland Facility - Portland, Oregon

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

Project Number	1056-03	Figure
September 2012		2

Attachment A

Memorandum: *Reported Outfalls, Willamette Cove Upland Facility* (Port and Metro, 2006)

MEMORANDUM

TO: Kevin Parrett (DEQ)

FROM: Nicole Anderson (Port of Portland) and Jim Morgan (METRO)

Cc: Anne Summers (Port of Portland), Amanda Spencer (Ash Creek Associates), Mark Lewis (NewFields), and Rebecca Rawlinson (NewFields)

DATE: May 17, 2006

SUBJECT: Reported Outfalls, Willamette Cove Upland Facility

Purpose

The purpose of this memorandum is to summarize the findings of research and site reconnaissance conducted by the Port of Portland (Port) and METRO to assess the historical or current presence of five reported non-City of Portland ("non-City") outfalls at the Willamette Cove Upland Facility (the Facility).

Background

In a letter dated April 29, 2005, the Department of Environmental Quality (DEQ) informed the Port and METRO that Map 3-1b of the Portland Harbor Programmatic Work Plan identified five outfalls at the Facility (Integral, *et al*, 2004, see Attachment A). DEQ indicated the outfalls (designated WR-189 through WR-193) had not been identified during the Facility Remedial Investigation (RI) as potential sources and thus constituted a data gap. DEQ requested that the reported outfalls be addressed by collecting soil samples adjacent to the outfalls and having them analyzed for select constituents.

The Port and METRO responded to DEQ in a letter dated July 14, 2005, indicating the referenced outfalls had not previously been observed at the Facility. The Port and METRO agreed to obtain additional historical information on the potential presence and location of the outfalls and use the information to conduct site walks to confirm whether the outfalls are currently present at the Facility. Following this review, the Port and METRO would be better able to provide a technically supported response to DEQ's request for sampling. This memorandum documents the scope and results of the review.

Scope of Work Performed

To evaluate the five reported outfalls, the Port and METRO conducted the following:

1. Personal communications with Integral personnel regarding the source of information on the reported location and presence of the outfalls.
2. Personal communications with relevant persons at the City of Portland (City).
3. Review of available historical Facility records to assess whether the presence of any outfalls had been observed. This review also included maps and drawings of any drainage features that may have existed historically.
4. Submittal of records requests to the City to obtain the basis for identification of the outfalls.

5. Site walks and a concurrent boat and land site reconnaissance.

Results of Interviews

The Port contacted Integral, the Lower Willamette Group's consultant who prepared the Programmatic Work Plan, to determine the source of information used to generate Map 3-1b. According to Integral, the information on the presence and location of the outfalls was obtained from the City of Portland (City).

The Port followed up with Loren Shelley at the City's Bureau of Environmental Services (BES), who indicated the outfalls were initially identified by John Holtrop, a BES employee, during a visual inspection of the area in 1998. BES conducted their evaluation using a boat or by walking the shoreline, or combination thereof. Following visual inspection, the coordinates of the reported outfalls were obtained using a hand-held geographical positioning system (GPS) device. The City did not conduct any further assessments or record reviews to confirm the historical or current presence of the outfalls prior to the development of Map 3-1b. The Port requested the underlying materials from the 1998 inspection from BES, including field notes and photographs; however, BES was not able to locate any records and reported they were not available.

Results of Historical Review

A review of the historical reference materials the Port has compiled for the Facility was conducted to determine if documentation exists that would provide information on either the historical or current presence of outfalls at the Facility. Reference to two of the reported outfalls, WR-189 and WR-190, was identified in communications from the City; no other outfalls were referenced in the Port's files. In addition, Ash Creek reviewed the following documents for references to historical outfalls in the locations reported by the City:

- Existing Data/Site History Report, Willamette Cove, Portland Oregon. Prepared by Hart Crowser and dated November 8, 2000.
- An assessment of the Potential for Archaeological and Historical Resources at Willamette Cove, Portland Oregon. Prepared by Archeological Investigations Northwest, Inc. and dated March 4, 2003.
- Remedial Investigation, Willamette Cove, Portland Oregon. Prepared by Hart Crowser and dated March 11, 2003.
- Remedial Investigation Addendum: Supplemental Preliminary Assessment of the Willamette Cove Upland Facility, Portland Oregon. Prepared by the Port of Portland and dated September 19, 2003.

The above reports summarize available information on historical structures, site use, and history for the Facility. References to outfalls WR-189 and WR-190 were included in the reports, based on the City's 1998 site walk. Outfall WR-189 was reported on the West Parcel; operations have not occurred on the West Parcel since about 1979. Outfall WR-190 was reported on the Central Parcel; operations concluded on the Central Parcel by 1981.

No references to or information on any other historical non-City outfalls were found in the above reports (either in the locations reported by the City database or at other locations).

Results of Site Reconnaissance

The Port and METRO conducted several field activities to evaluate the reported presence of these five outfalls, including:

- A site visit by METRO personnel on May 6, 2005;
- A site visit by Port and Ash Creek personnel on May 11, 2005; and
- A concurrent boat and land site reconnaissance performed by Port, Ash Creek and Newfields personnel on November 21, 2005.

The three separate site visits were conducted in an attempt to locate the reported non-City outfalls. In preparation for the site visits, a list of potential outfalls in the area of the Facility was obtained from the City (see Table 1). According to BES, the list and reported locations was developed based on the site visit conducted by John Holtrop (BES) in 1998. As described above, the potential outfalls were identified by BES during a walk of the shoreline and the coordinates were obtained using a hand-held GPS device. Using the City's geographical data, Newfields plotted the approximate locations of the outfalls on an aerial photograph of the Facility (Attachment B).

Based on the information from the City(, there were six potential outfalls within the Facility boundaries (Table 1, Attachment B). One potential outfall (OF-49) is an active City stormwater discharge point. The other five potential outfalls (WR-189, WR-190, WR-191, WR-192, and WR-193) are listed as "METRO Property", and their status is listed as "unknown" in the City's database. The following describes the results of each site visit. The locations of features observed during the site walks that are described below are noted on Figure 1, attached.

May 6, 2005 Site Visit. Jim Morgan of METRO conducted a walk of the shoreline of the Facility to evaluate the potential presence and location of the reported non-City outfalls. Mr. Morgan was unable to locate any outfalls corresponding to the locations of WR-191, WR-192, and WR-193 that were reportedly located on the East Parcel (see Attachment A). Mr. Morgan did observe a metal sleeve surrounding a concrete or masonry liner (the inside was plugged with concrete). Rivets were noted on the metal sleeve indicating it was unlikely to have been used as a pipeline. Figure 1 references the approximate location of this feature and Figure 2 includes photographs taken during Mr. Morgan's visit. Mr. Morgan also observed a small diameter (approximately 4-inch) steel pipe located at the top of the riverbank in the southern part of the beach area of the Central Parcel (see Figure 2). The City outfall (OF-49) was observed in the beach area of the Central Parcel. Northwest of the City outfall, Mr. Morgan identified an approximate 2-foot diameter corrugated steel pipe that appeared to be a historical outfall corresponding with the approximate location of WR-189 (see Figure 2).

May 11, 2005 Site Visit. Kristi Maitland of the Port of Portland and Mike Stevens of Ash Creek Associates conducted a site walk on May 11, 2005 to observe features on the riverbank, specifically in the areas of the potential outfalls identified by the City. Photographs from Ms. Maitland's and Mr. Stevens' site walk are shown on Figure 3. Consistent with Mr. Morgan's findings, Ms. Maitland and Mr. Stevens were not able to locate any outfalls corresponding to the locations of WR-191, WR-192, and WR-193 on the East Parcel. Ms. Maitland and Mr. Stevens also observed the metal sleeve surrounding the concrete liner and confirmed the liner was plugged with concrete (see Figure 3). Based on field observations, they concluded the feature was likely metal debris that was on the riverbank. Ms. Maitland and Mr. Stevens also noted a smaller diameter concrete pipe buried in the riverbank that was filled with soil in the approximate vicinity as reported outfall WR-190 (see Figure 3). This pipe is a jointed concrete drainage pipe, with an inside diameter of approximately 6 inches. It was unclear if it is just a section of pipe embedded in the riverbank or was historically connected to a drainage pipe; however, it is now filled with soil. The City outfall OF-49 was also observed during Ms. Maitland's and Mr. Stevens' site visit (see Figure 3). Since the river water level was higher during the May 11, 2005 site visit, the 2-foot diameter corrugated steel pipe located northwest of OF-49 was mostly submerged. Consequently, the water level precluded traversing the rip-rap for closer observation of this feature.

November 21, 2005 Joint Site Walk and Boat Reconnaissance. Based on the site walks conducted in May 2005, it was determined that a site walk and boat reconnaissance needed to be conducted simultaneously to conclusively assess the shoreline for the presence of outfalls. Therefore, on November 21, 2005, a field team examined the riverbank area of the Facility by foot and by boat. The participants of the field team in the boat included Rod Struck (DEQ), Nicole Anderson (Port), Mic Dorrance, the boat operator (Port), and Amanda Spencer (Ash Creek). Mark Lewis (NewFields) and Rebecca Rawlinson (NewFields) were on the shore.

To coordinate the search effort, copies of the aerial photograph of the Facility depicting the reported outfall locations were provided, along with the list of potential outfalls and their reported coordinates. The shore team utilized a hand-held Garmin 12XL GPS unit to track the original coordinates that were provided by the City. Although the coordinates were determined to be of low precision, they were useful in establishing relative starting points for the respective outfalls. The field team conducted the search by visually inspecting the entire length of the riverbank on foot and from the boat, beginning at the east end of the Facility (upstream) and ending at the west end of site (downstream). Figure 4 provides photographs of key features observed during the boat reconnaissance and site walk. The following paragraphs summarize, by outfall, the findings of the field team's reconnaissance.

Outfalls WR-191, WR-192 & WR-193

Consistent with the May 2005 visits, the three reported non-City outfalls, WR-191, WR-192, and WR-193, could not be located by the field team. The water level was approximately 4 to 5 feet lower during this reconnaissance than during the May 2005 events, allowing more beach and rip-rap area to be searched in the attempt to locate these outfalls. In the vicinity of the GPS coordinates provided by the City for these three outfalls, pieces of rusty pipe (2-inch steel pipe) of varying lengths were observed, but the field team concluded they were not embedded in the riverbank.

Outfall WR-190

In the vicinity of reported outfall WR-190, the 6-inch diameter concrete pipe filled with soil was located and photographed (see Figure 4). As previously observed, the pipe appeared to be filled with soil and no evidence of water drainage was seen. At the time of observation, the end of the pipe was approximately 20 to 25 feet from the water's edge and additional pieces of the jointed concrete pipe were found on the beach closer to the river. It appears that the end of the pipe is above typical high water levels.

Outfall WR-189

The two-foot diameter corrugated steel pipe at location of the reported outfall WR-189 was located and photographed. At the time of observation, the end of the pipe was approximately 10 feet from the water's edge (the mouth of the pipe was at the water's edge during the May 2005 visits; Figure 4). The pipe had an inch or so of rock and soil in the bottom of it and no evidence of water drainage was seen. Consistent with the May 2005 visits, the 2-foot diameter pipe did not appear to be an active outfall.

City Outfall OF-49

The City's active outfall (OF-49) was located and photographed (Figure 4). This outfall is a jointed concrete pipe, with an inside diameter of approximately 15 inches. There were large rocks and concrete rubble near the end of the outfall. At the time of observation, the end of the pipe was approximately 10 feet from the water's edge (where it had been observed to be partially to almost fully submerged during the previous site visits; see Figure 2 and 3). No water was observed to be draining from the outfall during the field team's reconnaissance.

Additional Observations

- The concrete/masonry-lined metal sleeve that was observed southwest of the reported WR-190 location during the May 2005 site visits could not be confirmed, either from the boat or from land.

- The 4-inch pipe at the top of the southern beach area bank in the Central Parcel was located and photographed (see Figures 1 and 4). Based on a conversation with Jim Morgan (Metro), this is likely a steam line from a former boiler located on the site.

Conclusions

Based on the three site walks and the boat reconnaissance, and review of Port files, reported outfalls WR-191, WR-192, and WR-193 do not exist and should be removed from the City's outfall database and from any maps depicting outfalls (current or historic) along the Willamette River. The reported outfall at WR-190 appears to be a 6-inch concrete pipe that is currently embedded in the riverbank and filled with soil. It is unknown whether this was ever a historical outfall. Reported outfall WR-189 appears to be a historical outfall and is no longer active. The available historical documents do not provide any information on the presence or use of these outfalls beyond the listings on the City's database. As stated above, operations on the West Parcel and Central Parcel have not occurred since 1979 and 1981, respectively.

With regard to these outfalls, Rod Struck (former DEQ project manager and participant in the boat reconnaissance) made the following observations in his Project Transition Memorandum dated December 8, 2005:

> "*Two historic outfalls were observed on-site. It does not appear that either of these outfalls is active. What these outfalls drained is unknown. These outfalls should be identified as potential historic sources of contamination and nearshore sediments evaluated as part of the LWG investigation".*

Neither WR-189 and WR-190 are active outfalls and should be removed from the City's database and from maps depicting active outfalls along the river.

Attachments:

Table 1	Summary of outfall locations within Willamette Cove Upland Facility
Figure 1	Aerial photograph Showing Key Features Observed During the Outfall Site Reconnaissance Visits
Figure 2	Outfall reconnaissance site visit photographs, May 6, 2005
Figure 3	Outfall reconnaissance site visit photographs, May 11, 2005
Figure 4	Outfall reconnaissance site visit photographs, November 21, 2005
Attachment A	LWG Map 3-1b Showing Reported Outfalls
Attachment B	Aerial Photograph Showing Estimated Locations of Reported Outfalls

Table 1. Summary of outfall locations within Willamette Cove Upland Facility

Outfall ID	INFORMATION PROVIDED BY CITY OF PORTLAND[1]							UPDATES BASED ON SITE VISITS[2]			
	Ownership[3]	Status	Size	Material[4]	Discharge	Longitude[5]	Latitude[5]	Post-visit Status	Description	Easting[6]	Northing[6]
OF49	City of Portland	Active	15"	CSP	Stormwater	7625417.1	706195.46	Active	15 inch ID; jointed concrete pipe	7625413.12	706196.36
WR-189	Metro Property	Unknown	24"	cmp	--	-122.75311	45.58191	Inactive	20 inch ID; metal corrugated pipe; with rock/debris inside	7625310.69	706281.62
WR-190	Metro Property	Unknown	6"	csp	--	-122.75091	45.58119	Inactive	6 inch ID; jointed concrete pipe; filled with soil	7625879.15	706083.42
WR-191	Metro Property	Unknown	4"	steel	--	-122.74696	45.58085	Does not exist	2 inch ID; rusted pipe on ground in vicinity; not connected to soil	na	na
WR-192	Metro Property	Unknown	4"	steel	--	-122.74608	45.58084	Does not exist	2 inch ID; rusted pipe on ground in vicinity; not connected to soil	na	na
WR-193	Metro Property	Unknown	5 Ofs	--	--	-122.7447	45.58075	Does not exist	2 inch ID; rusted pipe on ground in vicinity; not connected to soil	na	na

Notes:

1 City of Portland information was obtained from electronic correspondence with Loren Shelley (Portland Bureau of Environmental Services) and a GIS shapefile obtained from the City of Portland. The City of Portland includes the following disclaimer: Outfall information contained on this map is accurate according to available records; however, the City of Portland makes no warranty, expressed or implied, as to the completeness or accuracy of the information published.

2 Site visit conducted November 21, 2005

3 Ownership of non-City of Portland wells is based on adjacent property ownership at the time of the file and does not imply legal ownership.

4 A key to material abbreviations is not available in the information source.

5 Coordinates are presented in decimal degrees format for WR-189 through WR-193, and in State Plane feet format for OF49. The coordinate system was not noted in the information source.

6 Coordinates are presented in State Plane feet format; the projected coordinate system is 1983 North American datum HARN State Plane Oregon North FIPS 3601 International

-- = no information

ID = inner diameter; all measurements are approximations

na = not applicable

Legend:

- Pipe Location
- Estimated Outfall Location
- Site Boundary

Source: Base map prepared from a 2005 aerial photograph and surveyed GPS locations by NewFields.

N

0 250 500

Approximate Scale in Feet

Key Features Observed During Site Visit

Reported Outfalls
Willamette Cove Upland Facility
Portland, Oregon

Project Number	1056-00	April 2006	Figure
NEWFIELDS	Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	BBL Blasland, Bouck & Lee, Inc. engineers, scientists, economists	1

Figure 2. Outfall reconnaissance site visit photographs, May 6, 2005

Metal sleeve with concrete plug – apparent debris on rip-rap.
Rivets indicate this is not a pipe.

Interior of metal sleeve: concrete plug.

Four-inch diameter steel pipe protruding parallel to riverbank

Outfall OF49

Two-foot diameter corrugated steel pipe at reported location for potential outfall WR-189. Did not appear to be an active outfall.

Figure 3. Outfall reconnaissance site visit photographs, May 11, 2005

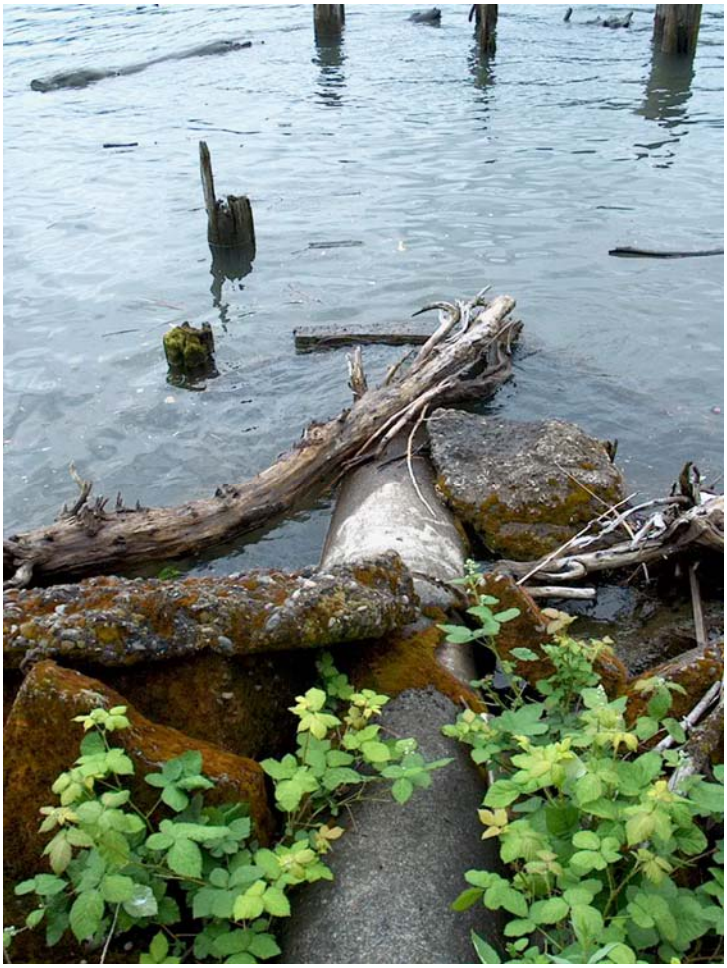
Metal sleeve surrounding concrete interior.

Concrete interior and plug.

Vicinity of potential outfall WR-191; Outfall not found.

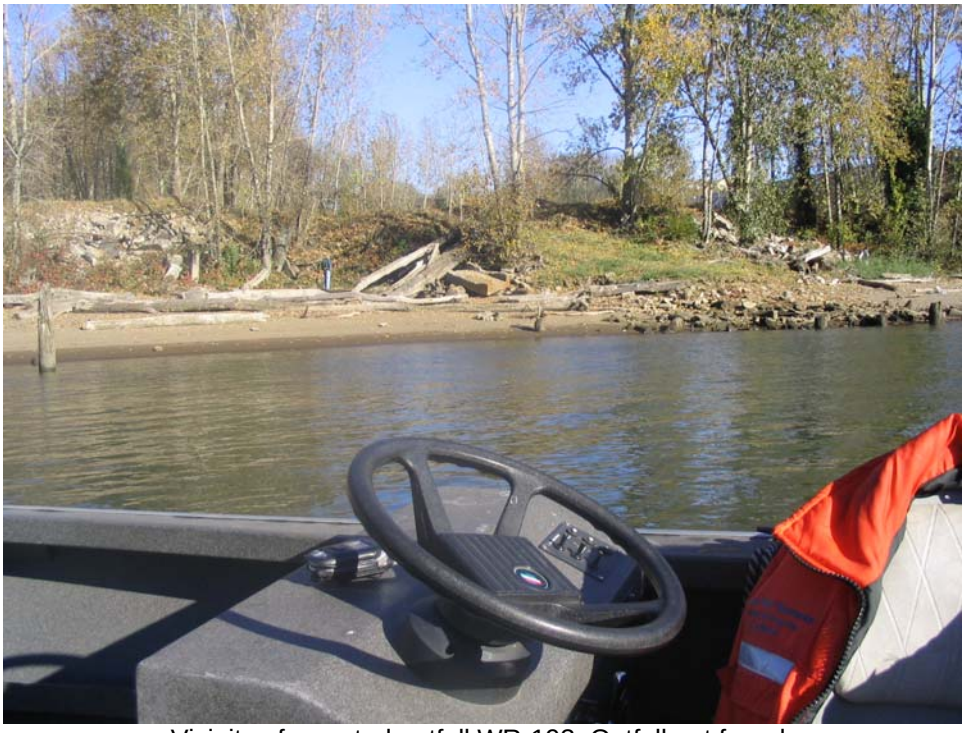
Vicinity of potential outfall WR-190; buried pipe filled with soil.

Vicinity of potential outfall WR-190; buried pipe filled with soil.



Outfall OF49

Figure 4. Outfall reconnaissance site visit photographs, November 21, 2005



Vicinity of reported outfall WR-193; Outfall not found.

Vicinity of reported outfall WR-192; Outfall not found.

Vicinity of reported outfall WR-191; Outfall not found.

Vicinity of reported outfall WR-190; buried pipe filled with soil.

Possible pieces of concrete pipe in vicinity of WR-190 on beach.

Six-inch diameter pipe; likely a steam line from former boiler.
Not in a reported outfall location.

Outfall OF49

Two-foot diameter corrugated steel pipe at reported location for potential outfall WR-189. Did not appear to be an active outfall.

Outfall 48
× 19 acres

Outfall 53
× 46 acres

Outfall 53 cso
× 102 acres

Outfall 52 cso
× 126 acres

Outfall 50
× 49.6 acres

Outfall 52A
× 39 acres

Outfall 52
43.2 acres

Outfall 49
× 64 acres

M1 BASIN
175 ACRES

S1 Basin
24.5 acres

S6 Basin
23 acres

22B BASIN
× 37 ACRES

22 BASIN
× 88 ACRES

22C BASIN
× 1008 ACRES

19 BASIN
× 475 ACRES

Saltzman Creek Basin
× 1105 ACRES

Toyota Motor Sales
Union Pacific Railroad/Former St. Johns tank farm
Port of Portland-Terminal 4 Slip 3
T4 Auto Storage Area
MarCom, Inc.
City of Portland BES Water Pollution Control Lab
Crawford Oil Corp.
Willamette Cove - West Parcel
Willamette Cove - Central Parcel
Willamette Cove - East Parcel
McCormick & Baxter Superfund Site
Triangle Park LLC
Freightliner
U.S. Coast Guard - Portland Stn.
Fred Divine Diving & Salvage Co.
Cascade General Ship Repair Yard
Railroad Bridge
St Johns Bridge
Willamette River
Mobil Oil Terminal
ST Services/Shore Terminal
Foss Maritime / Brix Maritime
General Construction
Transloader Intl. Co.
Hendrix Towboats
Marine Finance Corporation
U.S. ACOE Portland Moorings
Koppers Industries, Inc.
GASCO
Wacker Siltronics Corp.
Atofina
Willbridge Bulk Fuel Area
Saltzman Cr
GS Roofing Products
Kinder Morgan
Chevron
Shell Oil & Great Western Chemical
Front Ave. LLP/Glacier NW
Front Ave. LLP
Zidell - Tube Forgings
Schnitzer-Doane Lake
Could Industries
Aventis Crop Science
Santa Fe Pipelines
Olympic Pipeline Co.
St. Helens Road Petroleum Contamination
Chevron USA Asphalt Refinery
Schnitzer-Kittridge site
ConocoPhillips
BNSF Willbridge Yard
Anderson Brothers Property
Forest Park
Ward Bluff
WILLAMETTE BLVD
GERMANTOWN RD
RM-5
RM-6
RM-8
OF 53
OF 52A
OF 52
OF 50
OF 49
OF 48
OF 22C
OF 22B
OF 22
OF M1
OF S6
OF 19

OUTFALLS
- CITY STORM
- CITY CSO
- CREEK
- Non-City outfalls 11-05-2001

City Outfall Drainage Basin Boundary
- Storm Drainage
- High-level Separated CSOs
- Outfall Drainage Basin Label
- River Miles
- Bridge
- Navigation Channel
- Docks & in-water structures -20 01
- Willamette River Watershed
- Forest Park

0 600 1,200 2,400 Feet

See Figure 3-1e for complete Drainage Basins

LWG LOWER WILLAMETTE GROUP
integral consulting inc.

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS .
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Docks & In-water Structures: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
City outfalls with partial updating: Points projected from Cit of Portland tabular file. and updated with Dawn Sanders work plan comments 2/03. (Positional accuracy unknown)
Non-City Outfalls (current or abandoned) : (Other Outfalls-110501) p ositions were edited or moved to fall close to the river-edge. Positional accuracy is unknown. Points were projected from lat/long table from City of Portland.
City Drainage Basins: City of Portland GIS themes for basins in the ISA. Basin boundaries are draft and may be revised based on additional analysis.

File name: W P-2003_3-1_Outfalls_.mxd
PLOT DATE: 0 9/16/03

*Emergency bypass only;
basin boundary currently being evaluated

N

Map 3-1b
Portland Harbor RI/FS
Outfalls and Drainage Basins

Legend:

- Estimated Outfall Location
- Site Boundary

N

0 250 500

Approximate Scale in Feet

Source: Base map prepared from a 2005 aerial photograph and surveyed GPS locations by NewFields.

Estimated GPS Locations of Reported Outfalls

Reported Outfalls
Willamette Cove Upland Facility
Portland, Oregon

Project Number	1056-00	April 2006	Attachment
NEWFIELDS	Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	BBL Blasland, Bouck & Lee, Inc. engineers, scientists, economists	B

Attachment B

Photograph Log

Attachment B
PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-03

Client: Port of Portland
Location: Portland, Oregon

Photo No: 1 **Photo Date:** 8/8/2012 **Orientation:** North **Description:** 5-inch steel pipe debris observed in oversteepened riverbank on the northern portion of the Inner Cove Beach on the East Parcel. Note the debris (e.g., bricks, clay tile, concrete) in the foreground. White bracket highlights approximately 5 feet of oversteepened riverbank.	

Photo No: 2 **Photo Date:** 8/8/2012 **Orientation:** Northeast **Description:** The white oval highlights a section of concrete pipe observed on the riverbank on the northern portion of the Inner Cove Beach on the East Parcel. The white square shows approximate the location of the pipe section shown in Photograph 1.	

Attachment B
PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-03

Client: Port of Portland
Location: Portland, Oregon

Photo No: 3 **Photo Date:** 8/8/2012 **Orientation:** Northeast **Description:** Rip-rap rock removed from the riverbank side of the concrete pipe confirmed that this pipe section was not connected to the riverbank.	

Photo No: 4 **Photo Date:** 8/6/2012 **Orientation:** North **Description:** 5-inch steel pipe embedded in the riverbank adjacent to historical riverbank sample location WC-SSP-1.	

Attachment B
PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-03

Client: Port of Portland
Location: Portland, Oregon

Photo No: 5 **Photo Date:** 9/4/2012 **Orientation:** Northwest **Description:** 5-inch steel pipe embedded in the riverbank adjacent to historical riverbank sample location WC-SSQ.	

Photo No: 6 **Photo Date:** 9/4/2012 **Orientation:** Southwest **Description:** Concrete/masonry-lined metal sleeve was observed in the vicinity of historical riverbank sample location WC-SSS. This is the same pipe segment that was observed in 2005.	

Attachment B
PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-03

Client: Port of Portland
Location: Portland, Oregon

Photo No: 7 **Photo Date:** 8/22/2012 **Orientation:** Northeast **Description:** 4-inch pipe observed on the southern portion of the Central Parcel beach. This is the same pipe that was observed in 2005 and reported to be a steam line from a former boiler located on the Facility.	

Photo No: 8 **Photo Date:** 8/22/2012 **Orientation:** Northeast **Description:** 5-inch hole observed in the riverbank on the northern portion of the Central Parcel beach. No pipe was observed associated with this hole. The hole appears to be an animal burrow.